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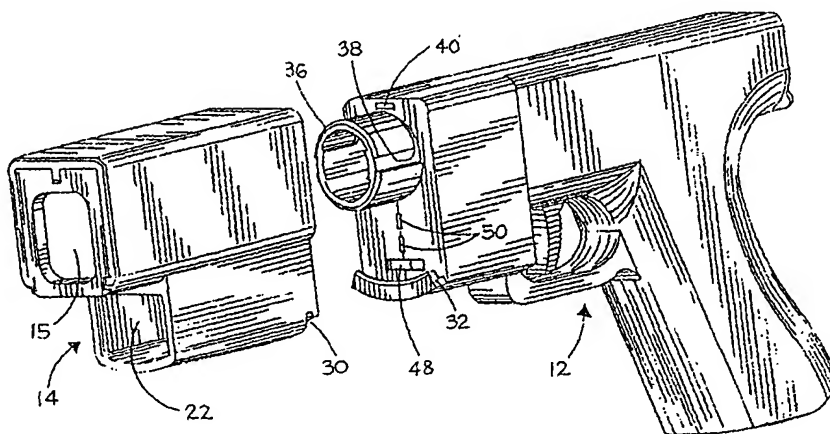
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(54) Title: AN IMPROVED ELECTRICAL DISCHARGE IMMOBILIZATION WEAPON



(57) Abstract: An electrical immobilization device with interchangeable cartridge modules. By changing modules, the device can be configured for launching a single electrode pair projectile having different distance characteristics. The appearance of the device can also be altered with a module change. Appearance may include a horizontally oriented gun style and a vertically oriented non-lethal style. A module with two contacts spaced apart can be added to immobilize a target located immediately adjacent. The module includes a dual laser sight to provide an accurate indication of the likely impact points for the remotely launched projectiles on a remote target. The device contains an ejection sleeve. Actuation of this ejection slide dispenses the fired cartridge to facilitate installation of the next cartridge for firing. The handle contains a removable, chargeable battery pack. The handle also contains a trigger and safety switch.

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AN IMPROVED ELECTRICAL DISCHARGE IMMOBILIZATION WEAPON

FIELD OF THE INVENTION

The present invention relates generally to the field of immobilization weapons of the type that fire a pair of wire-tethered electrical contacts at a remote target and provide a high voltage pulsed current through the contacts and the target to immobilize the target for a short period of time to facilitate capture and arrest by police officers. The invention pertains more specifically to an improved immobilization weapon that facilitates rapid ejection of a fired contact cartridge and rapid replacement of cartridge modules such as to alter the weapon's firing trajectory, modify its appearance or modify its function.

BACKGROUND ART

Electric discharge immobilization weapons have become a staple article in the arsenals of many urban police agencies. They offer police officers a non-lethal alternative for subduing violent perpetrators whose crimes or threats do not merit a lethal response, but who nevertheless must be temporarily immobilized to facilitate capture and arrest with minimal risk. Such weapons, known under the trademark TASER[®], provide a cartridge containing a pair of wire-tethered darts with a propulsive accelerant such as gun powder or compressed gas. The darts are fired toward a target that is typically within a range of about 25 feet from the weapon. Each dart is coupled by a fine wire to a respective output of a high voltage electrical circuit configured to disable the target without lethal or otherwise permanent effects. The circuit, batteries and an activation switch are typically contained in a hand-held housing which also provides at least one chamber for receiving the aforementioned cartridge. Typical prior art TASER[®] weapons are shaped much like a flashlight or other non-lethal-looking objects, a sometimes disadvantageous situation which may for example, embolden the target.

Once a weapon is fired, a police officer wishing to fire again, such as after a miss or to gain more effective disablement of the target, must typically manually remove the spent cartridge and insert a fresh cartridge into his or her weapon. This can be a time-consuming operation and therefore disadvantageous, especially when a threatening target is quickly approaching the officer who's attention is diverted to removing the spent cartridge from the weapon, a process which normally requires a fair degree of dexterity for most, if not all, conventional TASER[®] weapons. Moreover, typical cartridges may have different optimum maximum distance of effective operation. Depending upon the design of the cartridge in regard to angular orientation between the darts and the propulsive force of the gun powder or compressed gas, a cartridge may be optimized for relatively long range, (i.e., 20 to 25 feet) or for relatively close range, (i.e., 12 to 15 feet). An officer may wish to

have the ability to rapidly select one or the other of such cartridges depending on the particular circumstances in a threatening scenario. Moreover, the officer may prefer a long range cartridge for an initial firing, but prefer a shorter range version when firing another round at an approaching target.

SUMMARY OF THE INVENTION

The present invention may be characterized as a significantly improved immobilization weapon of the type disclosed above. The present invention provides an interchangeable module. This module contains the cartridge, dual laser sights and an ejection mechanism. The module is attached to the handle by the user and locked into place via a user-friendly latching mechanism. Attachment of the module provides the required electrical contact to the cartridge and dual laser sighting.

The handle contains all internal components required to operate the device including a removable battery pack. The handle provides a small, ergonomic grip that is an improvement over existing products. The small size facilitates carrying the device by law enforcement in a location such as the officer's belt. The handle also contains a trigger switch to discharge the weapon. It also provides a safety switch to ensure that the device is not fired inadvertently.

In the preferred embodiment, the user slides an ejection mechanism that ejects the previous cartridge and permits attachment of the next cartridge for firing. As the mechanism is slid forward, a protrusion slides the cartridge forward until it is dislodged from the device.

BRIEF DESCRIPTION OF THE DRAWINGS

The aforementioned objects and advantages of the present invention, as well as additional objects and advantages thereof, will be more fully understood hereinafter as a result of a detailed description of a preferred embodiment when taken in conjunction with the following drawings in which:

FIG. 1 is a three-dimensional view of a preferred embodiment of the invention taken from the cartridge module end of the weapon;

FIG. 2 is a three-dimensional view similar to FIG. 1, but taken from the handle end of the weapon;

FIG. 3 is a partially exploded view of a preferred embodiment as seen from the handle end;

FIG. 4 is a partially exploded view similar to FIG. 3, but seen from the cartridge module end;

FIGs. 5-7 provide a sequential illustration of the process of attaching a cartridge module to a handle assembly in the preferred embodiment;

FIG. 8 is a three-dimensional view of a cartridge module illustrating ejection sleeve operation;

FIG. 9 is a view similar to FIG. 6 but with the ejection sleeve omitted entirely to reveal pertinent spring members of the cartridge module;

FIG. 10 is an enlarged sectioned view of a cartridge module;

FIG. 11 is an enlarged three-dimensional view of the inner surface of the ejection sleeve;

FIGs. 12 and 13 are three-dimensional and elevational sectioned views, respectively, of a cartridge module shown in its nominal or rest mode;

FIGs. 14 and 15 are three-dimensional and elevational sectioned views, respectively, of a cartridge module shown in its partially released mode; and

FIGs. 16 and 17 are three-dimensional and elevational sectioned views, respectively, of a cartridge module in its full ejection mode.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring first to FIGs. 1 and 2, it will be seen that an immobilization weapon 10 comprises a handle assembly 12 and a cartridge module assembly 14. The latter has an ejection sleeve 16 and a cartridge bay 15 and the former has a battery compartment 11 and an electronics compartment 13. The preferred embodiment also provides an optional laser sighting compartment 22 in the cartridge module assembly 14 and a trigger switch 28 in a gun-shaped configuration of handle assembly 12.

The relationship between handle assembly 12 and a typical cartridge module assembly 14 may be understood best by referring to FIGs. 3 to 7. As seen therein, assemblies 12 and 14 are readily separated for replacement of one module assembly with another module assembly. The interconnection thereof provides both a stable, locked mechanical interface and a secure, safe and reliable electrical interface. The handle assembly 12 provides a handle bayonet 36 configured to be received in a matching cartridge module assemble receptacle 39 by means of an interlock groove 38 on bayonet 36.

The handle assembly also comprises an interlock rib 32, a handle cartridge contact 40, a cartridge module latch 48 and a pair of laser sighting contacts 50. The cartridge module also comprises an interlock groove 30, a latch receptacle 34, a module contact 44, bayonet interlocks 46 and a pair of laser contacts 42 matching contacts 50.

The process of interconnecting module assemblies 12 and 14 is depicted sequentially in FIGs. 5, 6 and 7. FIG. 5 shows the cartridge module assembly 14 in its initial alignment position relative to handle assembly 12 wherein the module assembly is turned 90° clockwise relative to its final configuration. In FIG. 6, the module assembly has been interfaced with the handle assembly by mating

receptacle 39 with bayonet 36. In FIG. 7, the module assembly has been rotated 90° clockwise to provide final mechanical locking an electrical contact for both the cartridge and the laser sighting device (not shown). Removal of the module assembly from the handle assembly is carried out in reverse. A latch actuator (not shown) releases latch 48 from latch receptacle 34 to permit rotation of the module assembly back to the position shown in FIG. 6. The spent module assembly is then separated from the handle assembly as shown in FIG. 5.

The cartridge ejection feature of the invention may be understood best by referring to FIGs. 8 to 17. In FIG. 8, ejection sleeve 16 of module 14 has been partially displaced from its rest position to reveal cartridge ejection control compartment 18 and to begin to eject cartridge 20. In FIG. 9, ejection sleeve 16 is removed to show a pair of sleeve springs 24 which resist the motion of the ejection sleeve to automatically return it to a rest position after a cartridge has been ejected. Also shown in FIG. 9 is a cartridge contact leaf spring 52. Spring 52 serves multiple purposes. One such purpose is to provide cartridge electrical contact to handle assembly 12 by means of contacts 44 and 40 (see FIGs. 3 and 4) wherein contact 44 is an integral terminal of spring 52. Another such purpose is to provide electrical contact through contact 58 (see FIG. 10) to a cartridge 20. Still another such purpose is to mechanically retain cartridge 20 until ejection sleeve 16 is translated to eject the cartridge. This is accomplished by retainer 54 (see FIG. 10) which is also an integral terminal of spring 52. As seen in FIG. 9, spring 52 has an inherent nominal condition wherein its end closest to bay 15 lifts up above the surface of compartment 18.

The various functions of spring 52 are facilitated by the internal surface structure of sleeve 16 which is shown best in FIG. 11. A spring retainer 56 secures retainer 54 in the rest position to assure cartridge retention. A pair of cartridge ejection members 62 push the cartridge 20 out of the cartridge module through the cartridge bay 15 upon translation of sleeve 16. A pair of spring controls 64 push

and compress sleeve springs 24 during sleeve translation. As the sleeve is translated, and ejection members 62 apply a translational force on cartridge 20, spring 52 at the retainer 54 end, is free to rise above the cartridge as retainer 56 is moved away from spring 52 as shown in FIGs. 12-17.

Having thus disclosed a preferred embodiment of the present invention, it being understood that various additions and modifications are contemplated and are deemed to be within the scope hereof; what we claim is:

CLAIMS

1. An electrical discharge immobilization weapon having at least one cartridge containing a pair of wire-tethered darts for being propelled toward a remote target upon closing an activation switch for applying a battery-derived electrical signal to a propulsion device in the cartridge; the weapon comprising:
a handle assembly having a battery and said activation switch; and at least one module having said cartridge;
said handle assembly and said at least one module being selectively releasable from one another for replacing said at least one module with another module.
2. The weapon recited in claim 1 wherein said handle assembly and said at least one module are configured for selective release from one another by relative rotation.
3. The weapon recited in claim 1 wherein said at least one module houses more than one said cartridge.

4. The weapon recited in claim 1 wherein said at least one module provides a pair of electrodes for contact with an adjacent target.

5. The weapon recited in claim 1 wherein said at least one module has a dual laser sight for aiming at a remote target.

6. The weapon recited in claim 1 wherein said handle assembly is shaped to simulate a handle of a pistol.

7. The weapon recited in claim 1 further comprising an ejection sleeve mounted on said at least one module in slideable engagement therewith for selectively ejecting said at least one cartridge from said module for replacement of said cartridge.

8. An electrical discharge immobilization weapon having at least one cartridge containing a pair of wire-tethered darts for being propelled toward a remote target upon closing an activation switch for applying a battery-derived electrical signal to a propulsion device in the cartridge; the weapon comprising:

a handle assembly having a battery and said activation switch; and at least one module having said cartridge;

an ejection sleeve mounted on said at least one module in slideable engagement therewith for selectively ejecting said at least one cartridge from said module for replacement of said cartridge.

9. The weapon recited in claim 8 wherein said handle assembly and said at least one module are configured for selective release from one another by relative rotation.

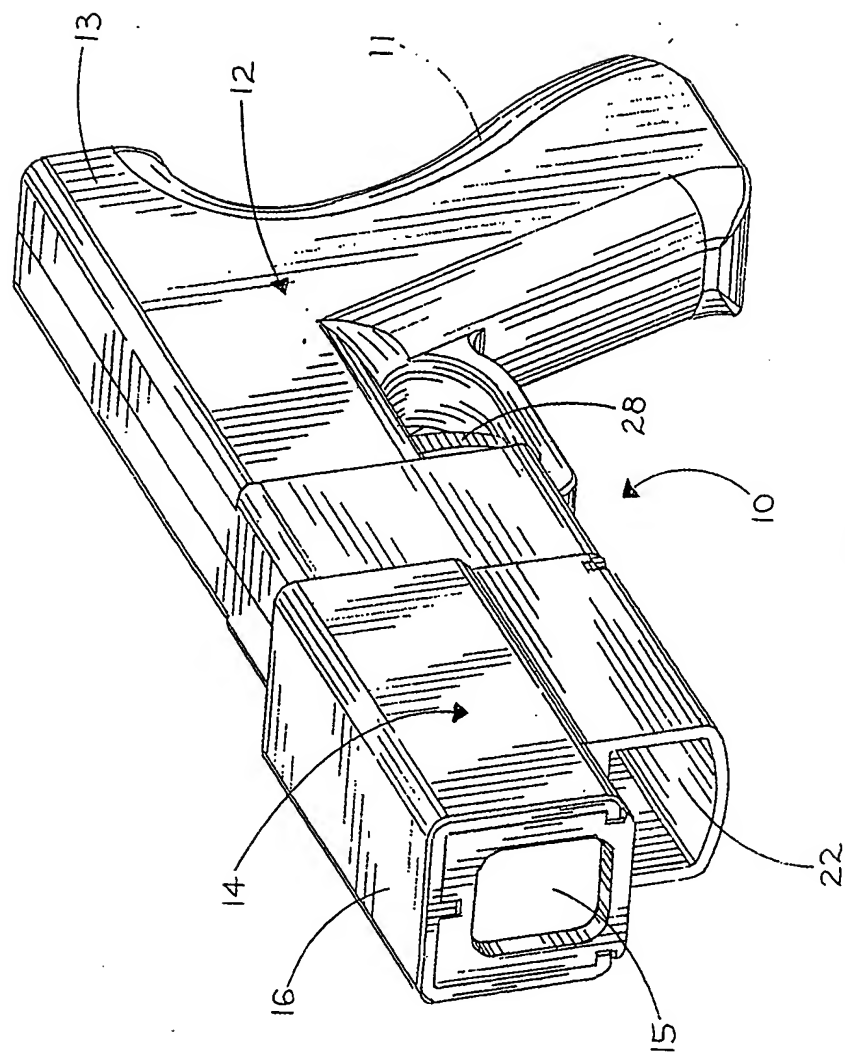
10. The weapon recited in claim 8 wherein said at least one module houses more than one said cartridge.

11. The weapon recited in claim 8 wherein said at least one module provides a pair of electrodes for contact with an adjacent target.

12. The weapon recited in claim 8 wherein said at least one module has a dual laser sight for aiming at a remote target.

13. The weapon recited in claim 8 wherein said handle assembly is shaped to simulate a handle of a pistol.

14. The weapon recited in claim 8 wherein said handle assembly and said at least one module being selectively releasible from one another for replacing said at least one module with another module.



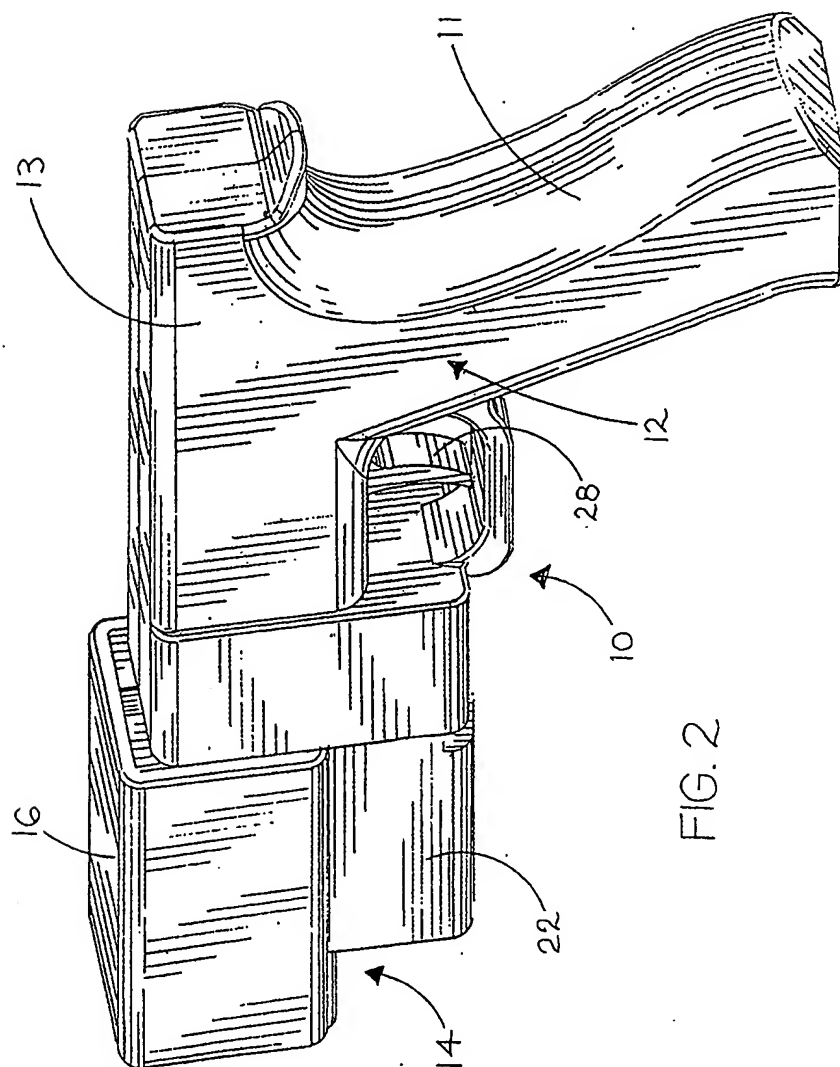


FIG. 2

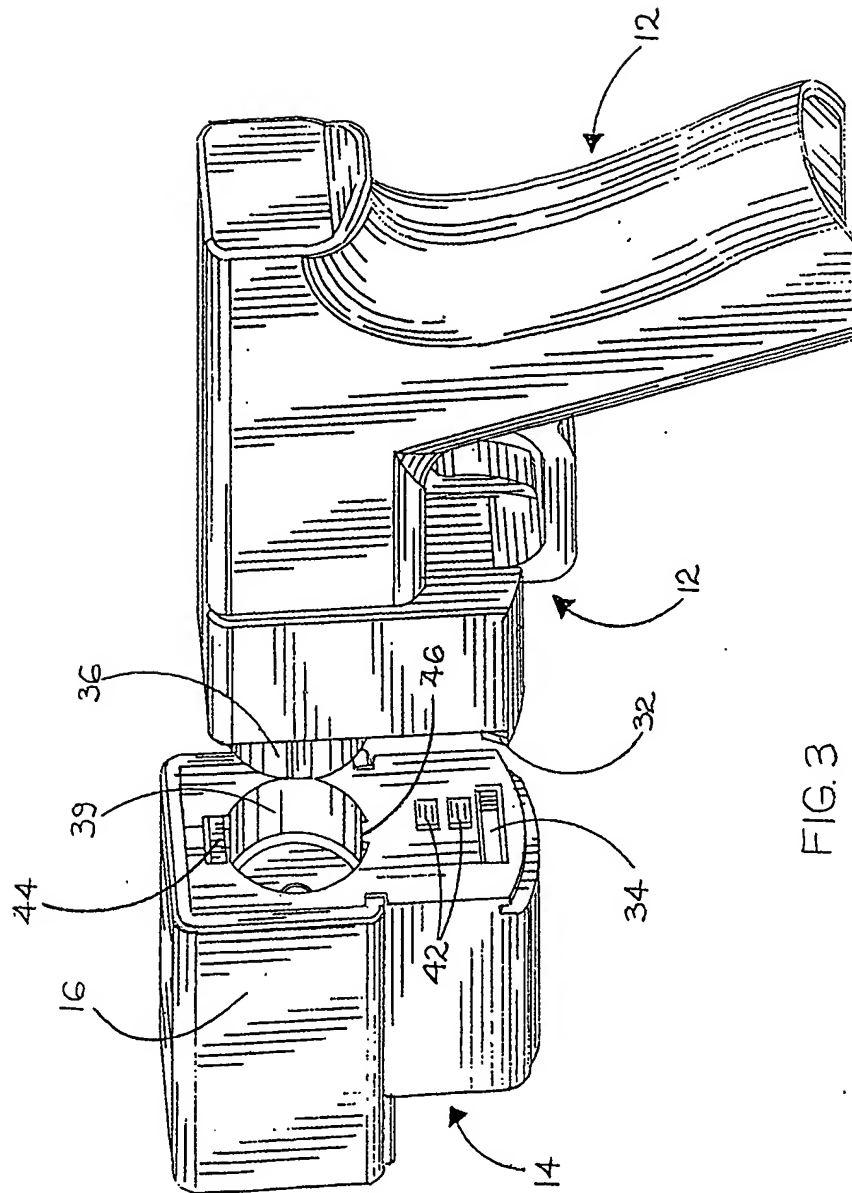


FIG. 3

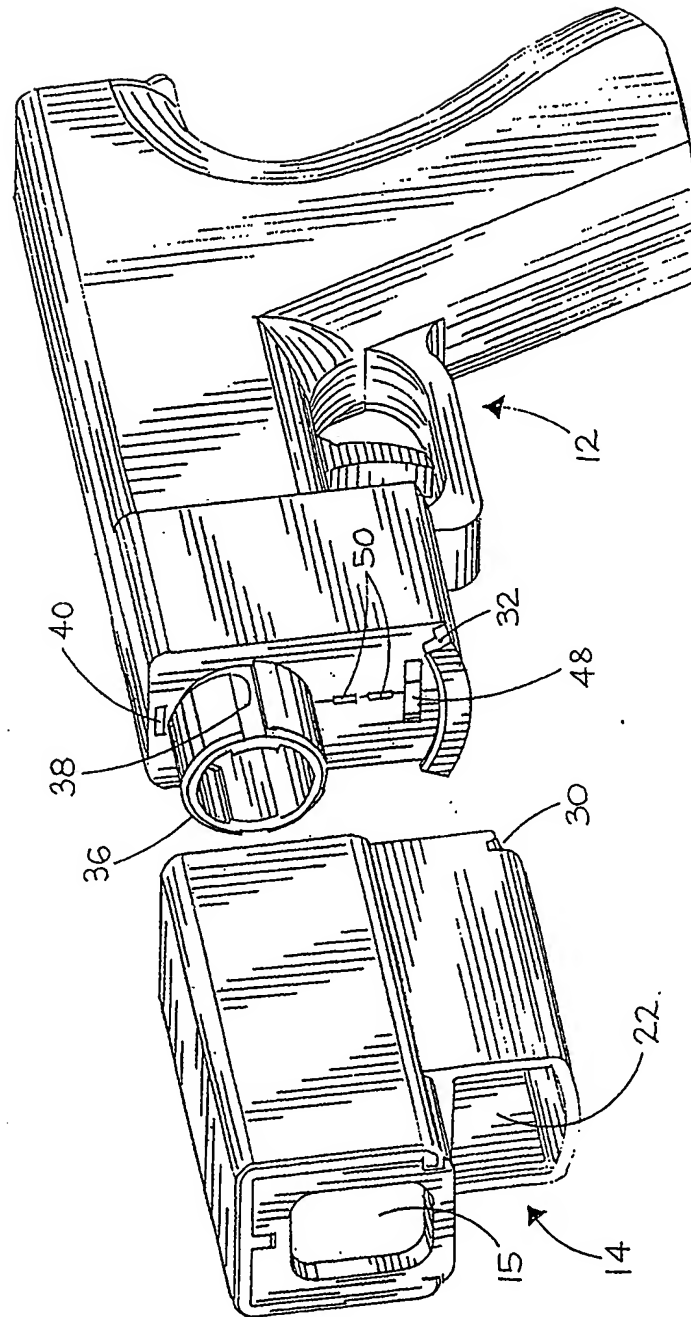


FIG. 4

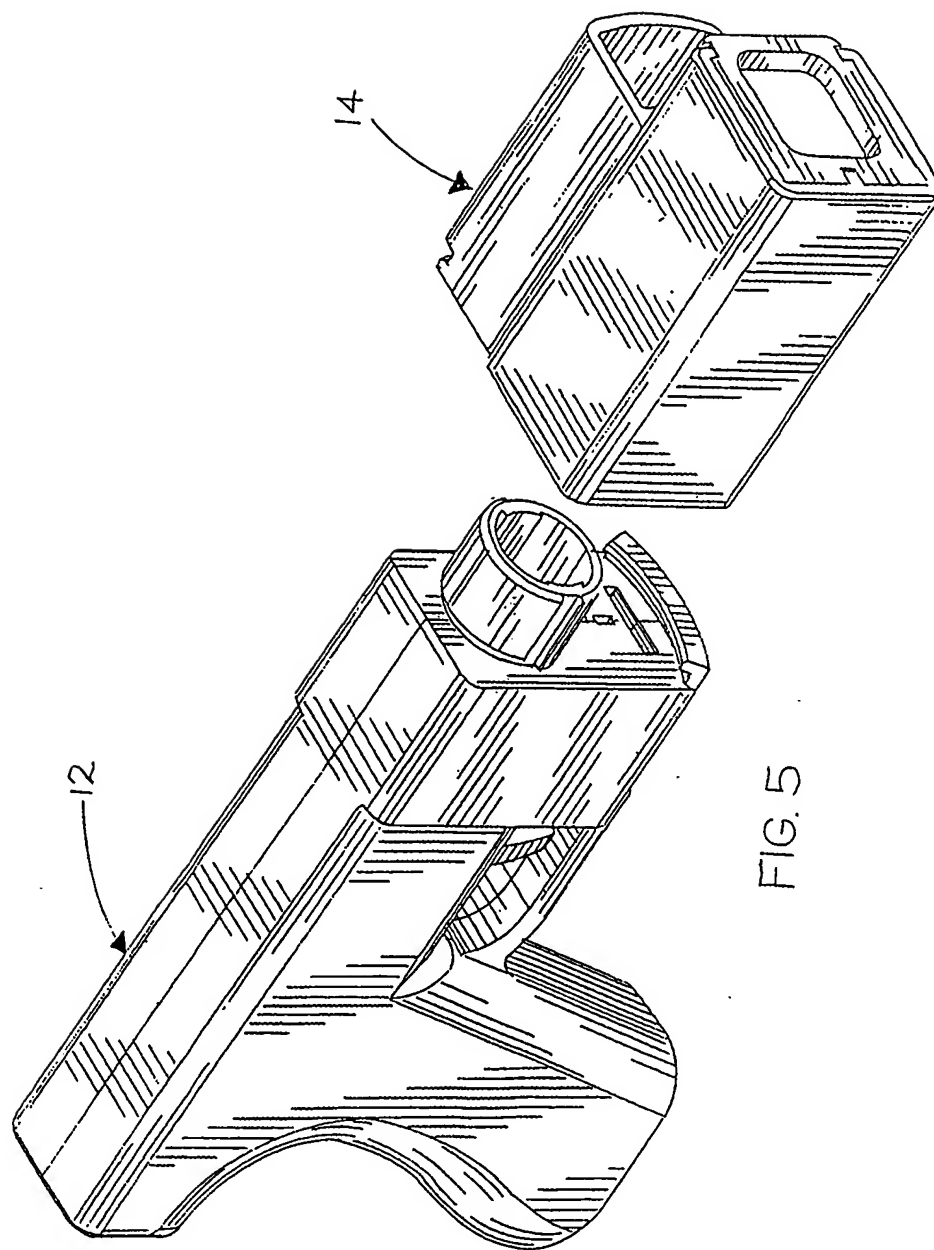


FIG. 5

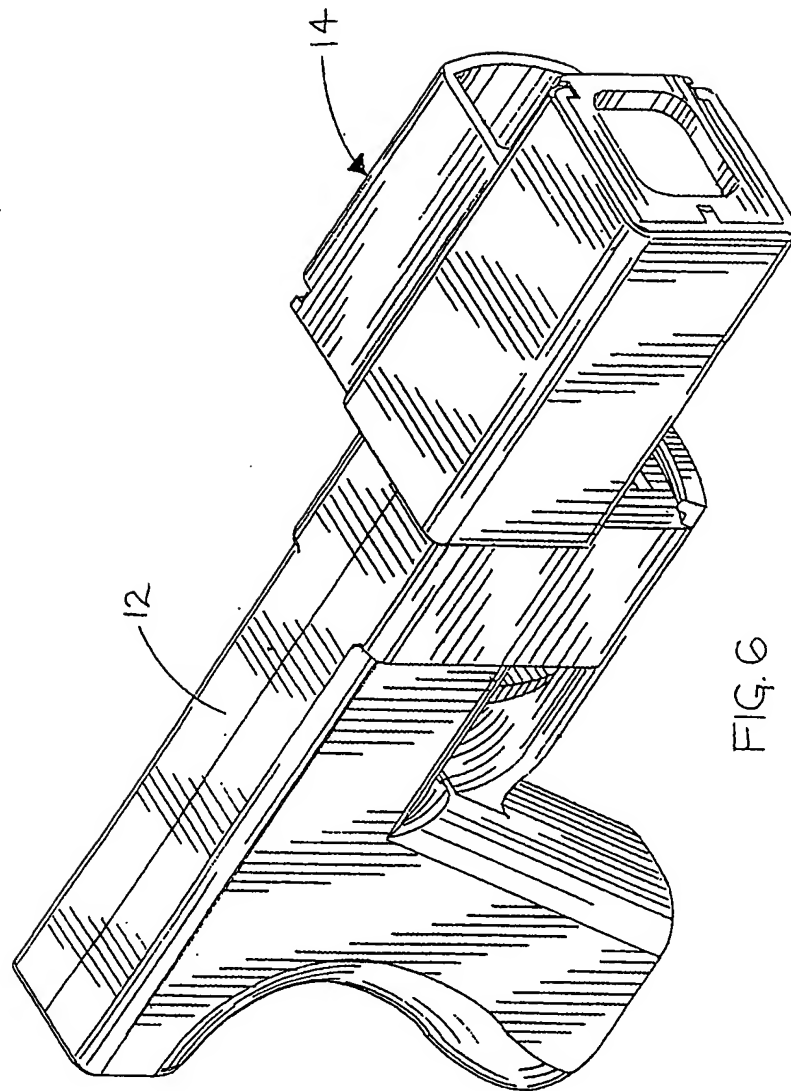


FIG. 6

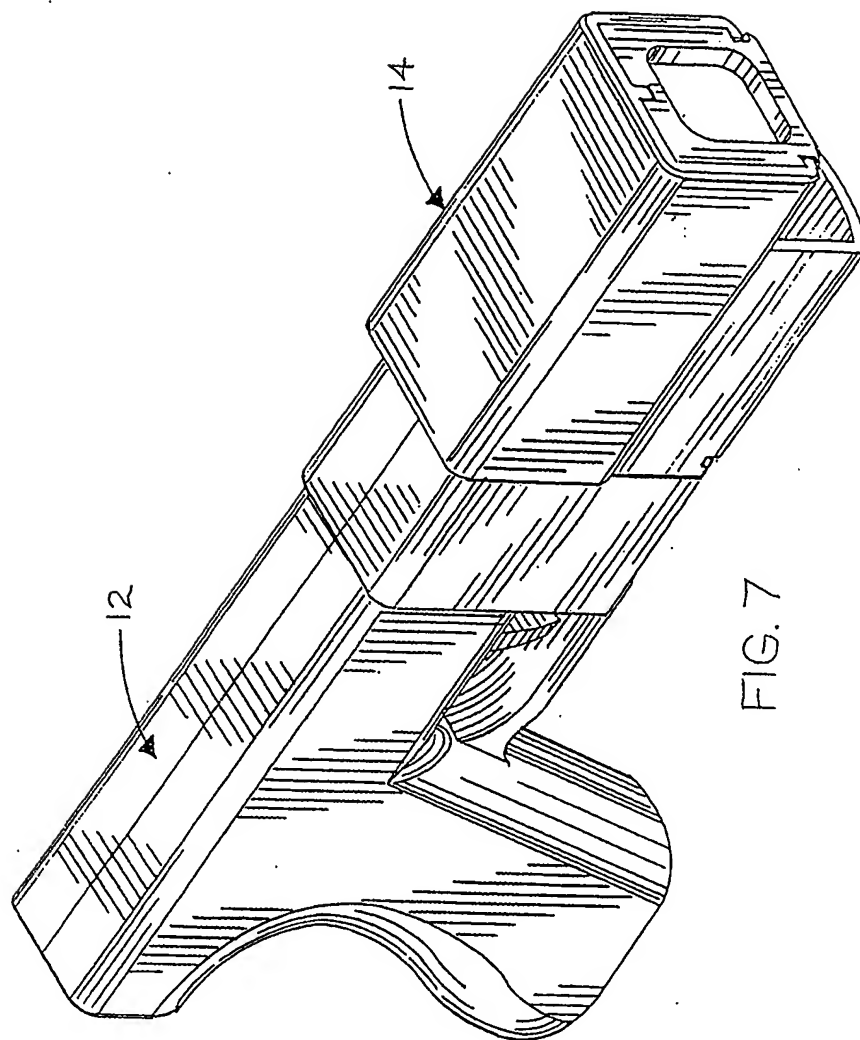
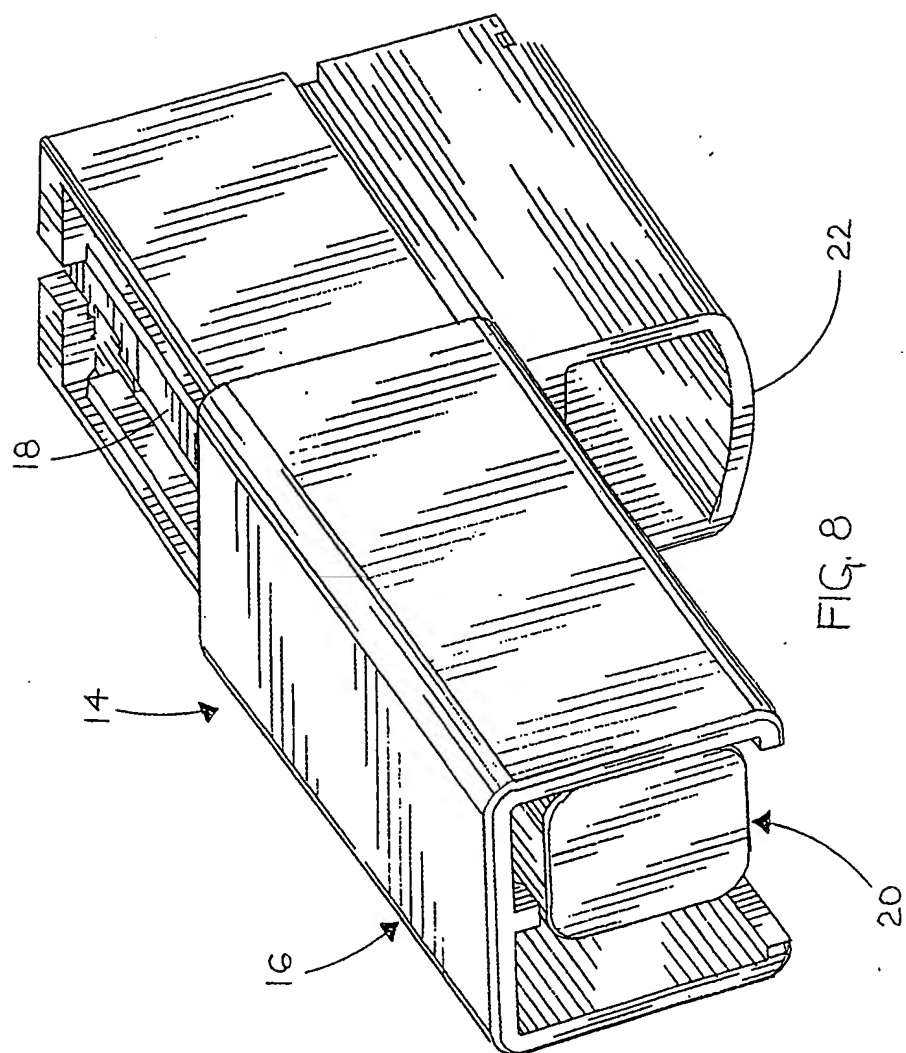
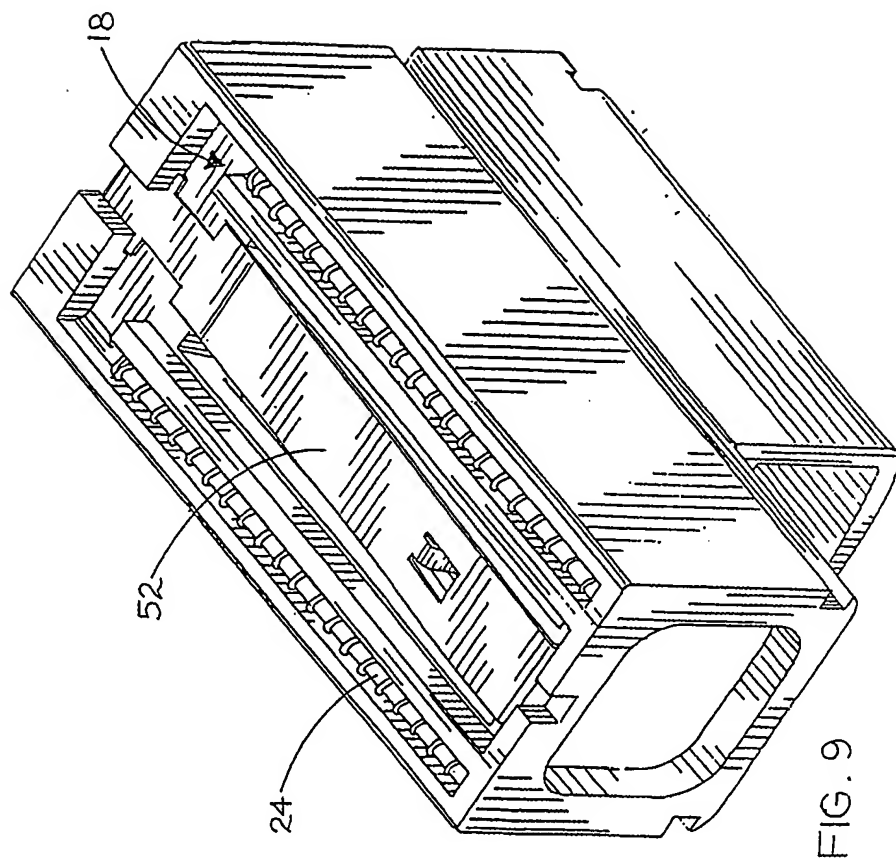
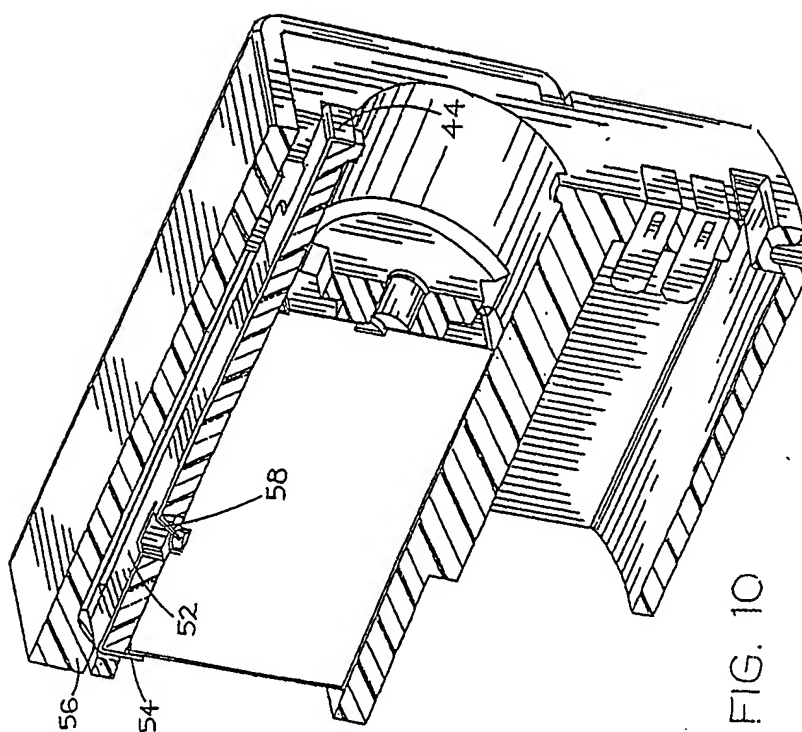
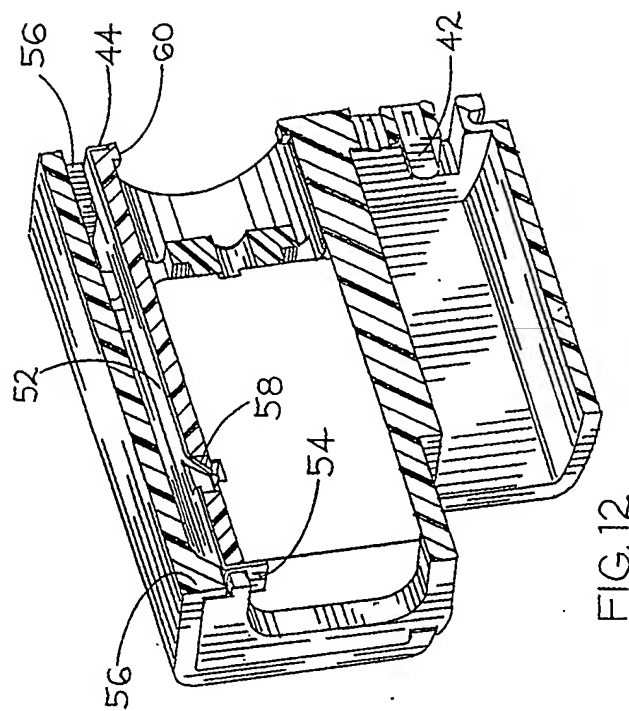
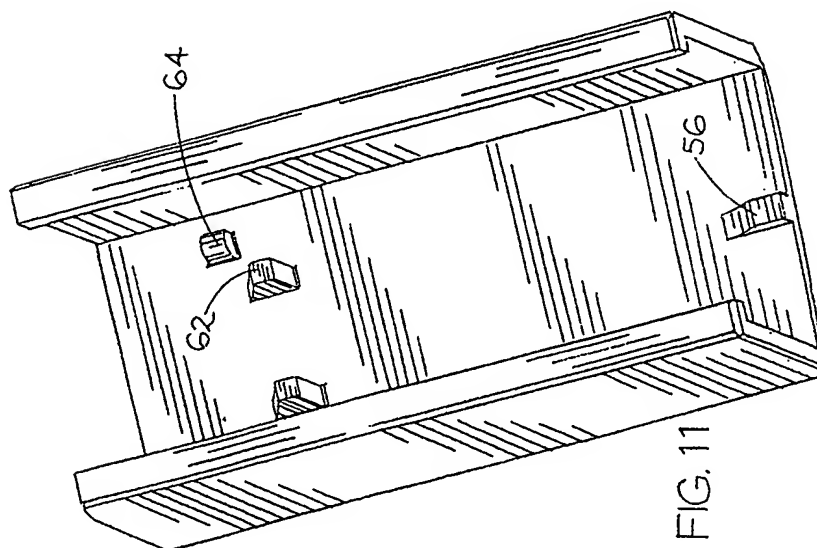


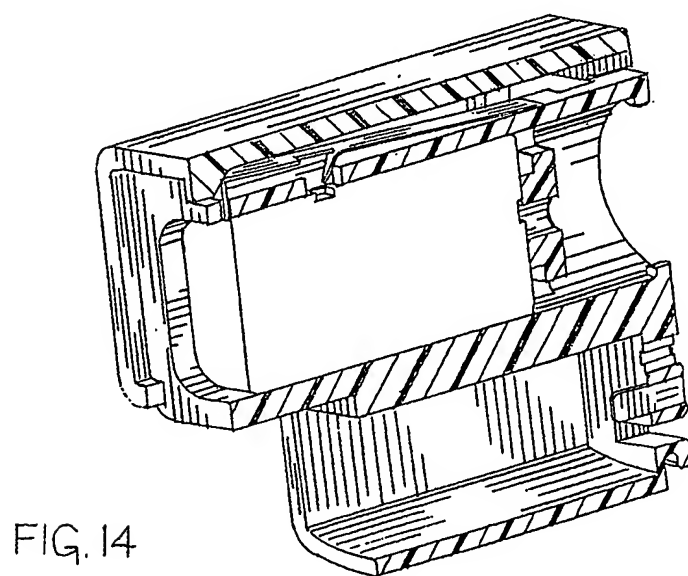
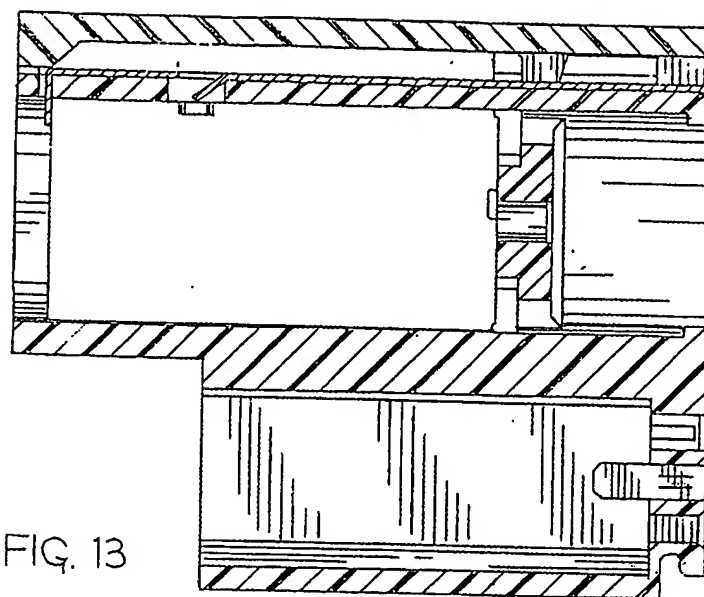
FIG. 7











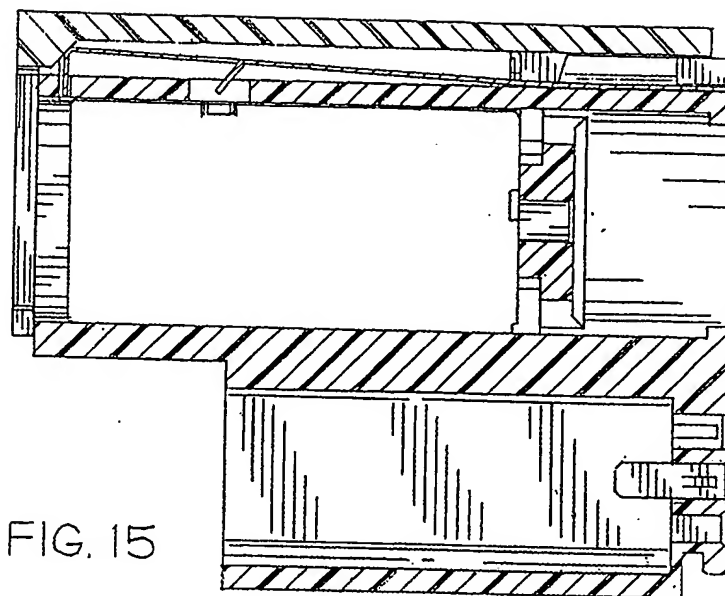


FIG. 15

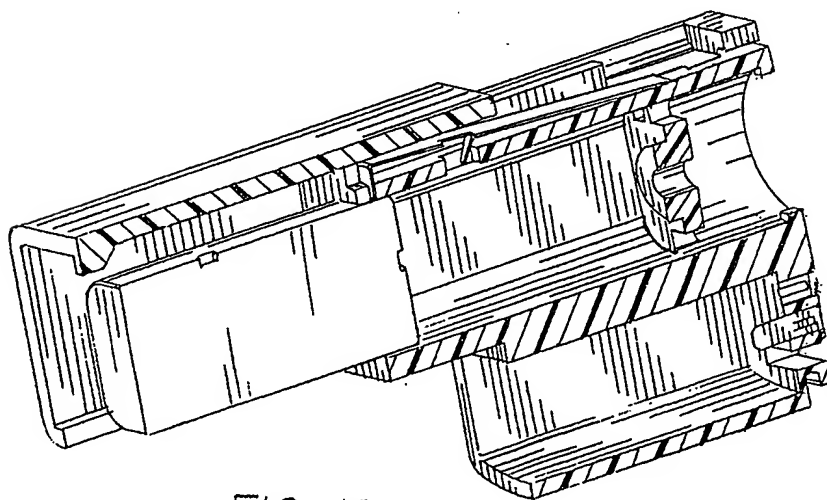


FIG. 16

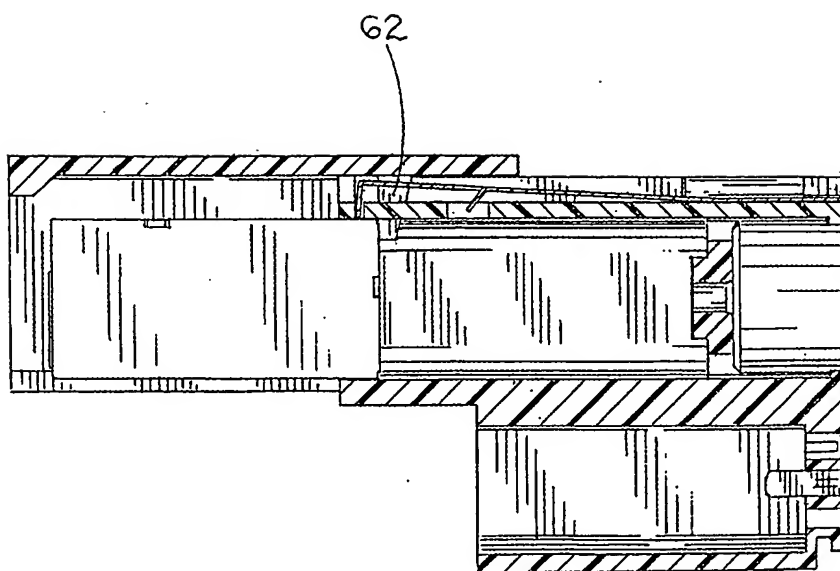


FIG. 17